Safety regulations

- The unit should be installed and operated by persons, who are familiar with these instructions and the current regulations for safety at work and accident prevention. Follow local regulations especially as regards preventative measures. Safety level of machine and safety equipment depends on reliability of the used interface.
- Avoid mechanical vibrations greater than 5 g/33 Hz both.
- Replacement and use of components, which are not certified by the producer may cause safety risk. Any guarantee is void following opening of the housing or unauthorised modifications.
- The unit should be panel mounted in an enclosure rated at IP 54 or better, otherwise dampness or dust could lead to function impairment.
- Adequate fuse protection must be provided on all output contacts with capacitive and inductive loads.
- The safety contacts are separated safely regarding to DIN VDE 0110 part 1 up to 300 V.

Installation

The safety relay must be panel mounted. There is a notch on the rear of the unit for DIN-Rail attachment. Please note for operation:

- Only the output contact 13/14 is a safety contact. Output contact X1 is a signal contact.
- To prevent a welding together of the safety contacts, a fuse (2 A slow acting) must be connected before the output contacts.

Cable runs:

- Cable: 2 x 1 mm²
- Capacitance: 150 nF/km
- Resistance: 28 Ohm/km
- Important details in the section “Technical Data” should be noted and adhered to.

Connection details

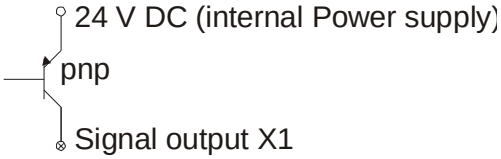
- Power supply to terminals A1 and A2.
- Connect the start/reset interlock circuit: Connect a normally open start/reset switch between X2 and X3 or use a connection from X2 to bn for automatic Reset (see Reset-Feature for details).
- Connect the safety outputs: Connect the normally open contact 13/14 into the machine safety circuit.
- Auxiliary signal output X1 (non safe) is a pnp-'open-collector'.
- Connect the transmitter/receiver: Connect the brown, white, green wire of the transmitter / receiver (PSE4-SL-01-T, PSE4-SL-01-R) at bn, we, gn1, gn2, gn3, gn4. If less than 4 safety edges are connected, free inputs must be bridged to the green lines of other inputs according to the following table:

Number of edges	terminal			
	Gn1	Gn2	Gn3	Gn4
1	OSE1			
2	OSE1		OSE2	
3	OSE1		OSE2	OSE3
4	OSE1	OSE2	OSE3	OSE4

Output X4

- If you use the control unit with 24 V AC power supply you need a ground potential in order to use the auxiliary signal output properly. Therefore the internal DC-ground is available on clamp 4.

Auxiliary signal output



Operation mode

- Manual reset (X2 – X3)

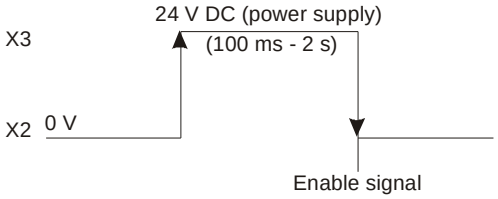
  When power is first applied there is no path through the safety contact 13/14. The auxiliary signal contact X1 connected to 24 V DC. If the start/reset switch is closed and opened again (0-1-0 edge), relay K1 and K2 close, if the light beam in the profile is “connected”. The safety contact 13/14 is closed and X1 is high resistive. When the light beam in the profile is “interrupted” the contact 13/14 will open the machine safety circuit. If the light beam is “connected” again the start/reset switch has to be used for a new start.
- Automatic Reset:

  Connect X2 to bn to get an automatic reset.

Reset-Feature

- Manually reset:

  Connect a reset-switch between X2 and X3. The control unit will act according to EN ISO 13856-2 (diagram A2) and paragraph 5.2.2 EN 13849-1. A “0-1-0” edge changeover is expected within a time frame of 100ms to 2s.



- Automatic reset:

If you connect X2 with bn with a bridge the unit acts according to EN ISO 13856-2 (diagram A3). The safety contact (13/14) will close immediately after all safety edges are inactuated.

Faults

- Short circuits and disconnection of the sensor wires are detected by the control unit.
- Faulty contact functions: In the case of welded contacts, no further activation is possible after an activation of the sensing edge.
- “OSE n” LED is not illuminated: Safety edge "n" is activated
- “STOP“ LED is not illuminated: At least one Sensing edge is activated or (manually) reset is not activated yet.
- “POWER“ LED is not illuminated: No power supply.
- “OSE 1...4” LEDs show a rotating light: An internal device error, dis- and reconnection to power supply, change control unit if it fails again
- No reaction after manual reset (X2/X3): Sensing edge is still activated, failure in sensing edge or cables, failure in control unit. (see reset-feature for further details)

Maintenance

The safety edge shall be tested yearly by optical inspection concerning defects. In case of any defect the safety edge shall be changed because the safety function is not guaranteed completely. The following inspections shall be done:

- Inspection of the rubber profile concerning defects e.g. cracks
- Inspection of the rubber profile concerning decreased elasticity e.g. due to aging
- Inspection of a close mounted seat
- Triggering of the safety edge by hand obstructing the rubber profile

Safety Properties OSE Safety Edge

The safety properties listed below are valid for the combination of PSE4-SL-01-T, PSE4-SL-01-R and PSE2-SC-02. They do not include values of the rubber profile.

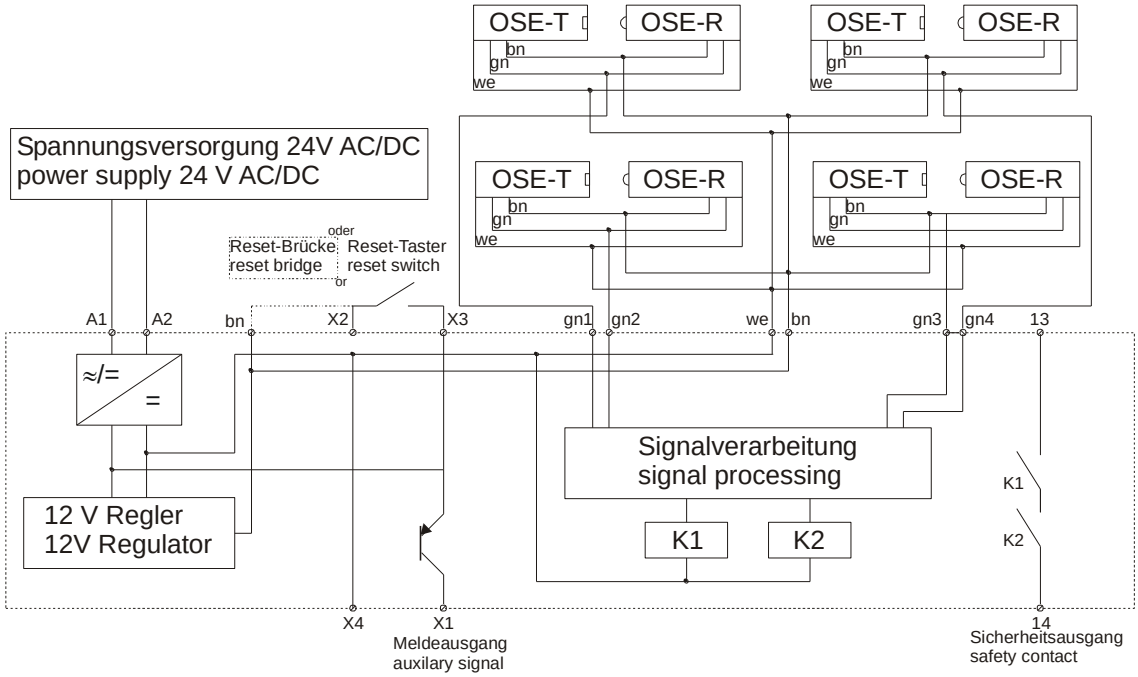
Safety Properties	**Sensors:** **PSE4-SL-01-T, PSE4-SL-01-R**	
Category	3 (EN 13849-1:2008)	
Performance level	d (EN 13849-1:2008)	
Maximum usage duration	20 years	
MTTFd *)	109 years	
PFH *)	1 x 10^{-7} per hour	
DC	87 %	
Reaction time	18 ms	

*) valid for $B_{10d} = 10^5$ and $N_{op} < 1$ per minute

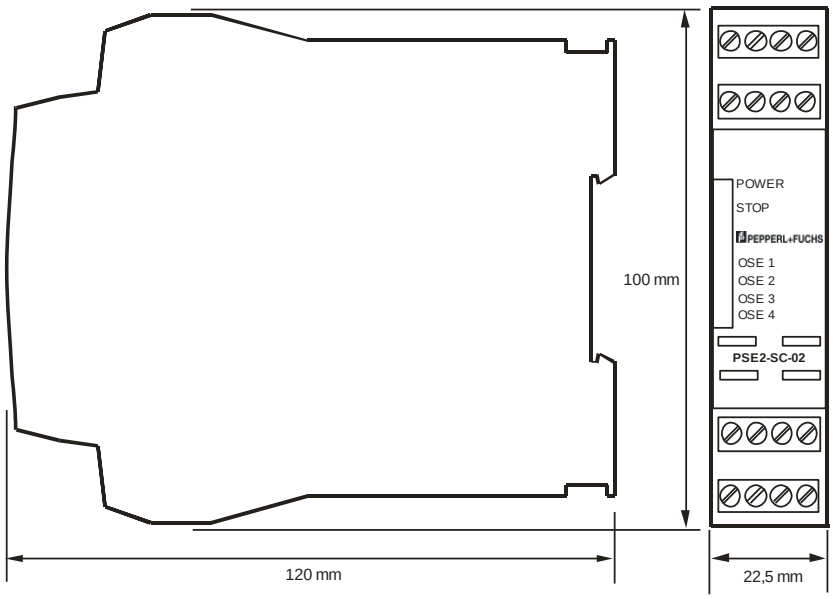
Technical Data PSE2-SC-02

Operation voltage	24 V DC: + 20 % / - 10%	24 V AC: + 10 % / - 10%
Fuse for power supply	1 A (slow acting)	
Power consumption	< 4 W	
Contact configuration	1 normally open safety contact	
	1 auxiliary contact	
Contact type	Forced relays	
Fuse for output contact	2 A (slow acting)	
Voltage at X1	PNP-„open-collector“ $U_{X1}=U_b$-1V I max. = 50 mA	
Creepage distance and clearance	VDE 0160 at pollution degree 2, overvoltage category III/4 kV Regarding VDE 0160	
Operation temperature	-10^o C to $+55^o$ C	
Terminal style	IP 20 regarding to DIN VDE 0470	
Housing style	IP 40 regarding to DIN VDE 0470	
Conductor connection	2 x 1 mm^2 solid wire or 2 x 1,5 mm^2 stranded wire with ferrule	
Relays Data		
Contact material	Ag Ni 10 + 0,2 µm Au	
Max. switching capacity (from relay data sheet)	1500 VA	AC 15: 230V / 3 A DC 13: 24 V / 4 A
Switching voltage	250 V AC / 60 V DC	
Switching current	2 A	
Mechanical service life	> 10^7 switching capacity	
B10 Values	DC13, 2A: 1 x 10^5 AC15, 2A: 1 x 10^7	
Miscellaneous		
Housing material	Housing: PC / PA, black, Clamps PA 6.6 V0	
Measures	Width: 22,5 mm, Height: 100 mm, Length: 120 mm	
Permissible position	Any	
Power on time	100 % DC	
Weight	0,15 kg	

Standard Funktionsschaltbild/Function diagram



Maße/Measures



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